

Analysis on the Application of Virtual Reality Technology in Operation Skill Teaching



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Abstract The improvement of the level of science and technology puts forward higher requirements on the operation skill level of various equipment operators. Virtual reality technology can better solve various problems in the operation skill training. This article starts with the advantages of virtual reality technology in the teaching of operating skills, combined with the characteristics of virtual reality technology, and proposes the composition of an operating skills teaching system based on virtual reality technology; finally, several issues that need attention in the use of the virtual training system are put forward.

Keywords Operating skills · Training system design · Virtual reality

1 Introduction

The advancement of science and technology and the continuous improvement of the equipment technology level require all types of operators to have a higher level of knowledge and operating skills [1]. To meet this requirement, traditional teaching methods are obviously not enough. We must vigorously promote operating skills. Optimization of teaching methods and improvement of teaching techniques during training. Due to its own advantages and characteristics, virtual reality technology has a very bright application prospect in the process of operating skills teaching [2].

2 The Advantages of Virtual Reality Technology in the Teaching of Operating Skills

Virtual reality technology strives to replace the real world environment with a synthetic virtual environment through computer simulation. These virtual environments act on the user's sense of sight, hearing, and touch, making learners feel like

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they are in the real environment and immerse themselves in it. Learners can participate in the virtual environment, and play a role in it, and conduct simulated operation training [3]. This learning form can break through many problems existing in the teaching of traditional operating skills and promote the development of students' operating skills.

2.1 Breaking Through Time and Geographical Restrictions

Traditional teaching of operating skills is often restricted by actual conditions such as venues, equipment, time, etc., especially when the number of students is large, the number of equipment is small, and the learning time is short, it is difficult to meet the actual training needs of students and cannot achieve good training effect. With the help of virtual reality technology, various limitations of traditional teaching can be completely broken. On the one hand, when using virtual reality technology for training, students can go deep into the learning object and deepen their understanding of the learning content. If you only use traditional media to teach, these will not be achieved [4]. On the other hand, in the actual teaching process, some experimental procedures and results are difficult to effectively present in a short time. With the help of virtual reality technology, this problem can be solved well, thereby greatly improving the teaching efficiency.

2.2 Has a Very High Teaching Efficiency

Compared with the investment in the construction of actual training places, the operation skill training system based on virtual reality technology can not only save costs, but also enrich education and teaching resources [5]. In addition, the virtual reality system is improved on the original basis, and the investment is not large when it is perfected, and it can well adapt to the reality of the current equipment upgrade speed. The simulated training environment created by virtual reality technology is no longer restricted by equipment, venues, time, etc., and practical skills training can be carried out anytime and anywhere, just like training in a real environment, greatly improving teaching efficiency.

2.3 Significantly Reduce Safety Hazards

A large part of the operation skill training is relatively dangerous. Through the advance training of the virtual training system, the students can be familiar with the movement essentials and get used to the training environment in advance, and then use the actual equipment for training, which can greatly improve the training

process. Misoperation of the system reduces the hidden risks and ensures the safety of students and equipment. And can carry out repeated training, repeated operation, make full use of teaching resources, and improve learning effect and efficiency.

2.4 Improve the Teaching Effect of Operating Skills

Virtual reality technology is widely used in operating skills training and teaching, not only enriching the original teaching media, extending the scope of education technology, but also providing strong support for operating skills teaching [6]. Not only can students' interest in learning be greatly improved, but also through simulation settings, students can be exposed to the future working environment, familiar with the working atmosphere, and proficient in job skills, so as to accumulate a certain amount of "work experience" for the Quickly adapt to job requirements and make full preparations in advance.

3 Composition of Operating Skill Training System Based on Virtual Reality Technology

The formation of operating skills cannot be accomplished overnight. It is a gradual process. Therefore, if you want to truly master operating skills, you must not only master the essentials of the process, but more importantly, it is possible to achieve complete mastery through repeated actual operations. Moreover, operation skills start from the training of individual skills, so in terms of system module design, it should include at least two parts: a single skill training module and a comprehensive skill training module.

3.1 Single Skill Training Module

The various sub-skills of all operating skills are not a simple distinction, they are not isolated, and the learning and mastering of various contents are interdependent and interrelated.

- (1) Theoretical knowledge module. It should mainly include most of the structure, working principle, precautions, etc. of the equipment to be learned. Through the learning of this part of the content, students can have an overall understanding of the equipment they are operating, and at the same time, it is convenient for them to think independently in the subsequent learning process [1].
- (2) Operation essentials module. On the basis of mastering theoretical knowledge, students should carry out simple operation essentials training. For

some complex equipment, the overall operation should be divided into small modules, and the method of mastering in sections should be adopted to learn step by step and proceed step by step. The content of each small module should include internship, basic training, assessment, etc., so that students can master it. On the basis of mastering each small module, training and mastering the overall operation are carried out.

- (3) Operation rules module. This module mainly includes all kinds of procedural knowledge of operating skills, including coping rules, connection rules of each sub-skill and summary of overall skill acquisition. The learning and mastering of these guiding rules will greatly promote the acquisition and transfer of skills.

3.2 Comprehensive Skills Training Module

The formation of comprehensive skills is definitely not a simple superposition of individual skills, but should provide different learning functions and create different learning conditions according to different learning modules to meet the needs of knowledge and skills learning at different stages and the effectiveness of mastery [7]. It needs learners to complete complex tasks in different situations and slowly build them. At the same time, the comprehensive skills training module should be set with different training scenarios, so that learners are familiar with the use environment and lay a foundation for actual installation training.

4 Problems that Should Be Paid Attention to When Using the Operating Skill Teaching System

Although the virtual reality system has advantages in the teaching of operating skills, due to the shortcomings of the technology itself, coupled with some objective problems, we still need to continue to explore and study the application of virtual reality technology in the teaching of operating skills.

4.1 Choose a Reasonable and Appropriate Teaching System

The virtual reality system itself is divided into many types, such as desktop, immersive, etc. Different virtual reality systems require very different investment, and the software and hardware technology platforms used are also very different. Each teaching unit should proceed from the actual situation of the unit, and combine the teaching object, teaching purpose, site funding and technical strength and other factors, and rationally choose a virtual reality system that can meet its own teaching needs, and must not be greedy for big and complete.

4.2 The Importance of Physical Training Cannot Be Downplayed

Although virtual reality technology has many advantages and should be used in actual training, the relationship between virtual reality and reality must be handled correctly. No matter what type of virtual reality technology is used, and no matter how advanced its technology is, the virtual must pass through or virtual, and there is always a certain difference from the real world, and it cannot completely provide learners with real and natural feedback. Therefore, it is necessary to correctly handle the relationship between actual installation and virtual teaching, and the importance of actual installation training must not be downplayed.

4.3 The Role of Teachers Should Still Be Emphasized

Virtual reality technology brings high efficiency and convenience to the learning and training of operating skills, and students can conduct independent training and independent learning. In this situation, it is easy to produce the idea of ignoring the importance of teachers and thinking that the status of teachers is weakened. This idea is very wrong. The skill training system is only an effective supplement to the actual installation training. It is an expedient measure when the teaching conditions are limited. It cannot and cannot completely replace the traditional teaching, especially the teacher's guidance be lacked. Without the guidance and supervision of the teacher, on the one hand, students will become lazy, and it is easy to cause uncontrolled situations in the learning process; on the other hand, if there is no teacher's guidance in the virtual training process, it is easy to form wrong actions. Problems are prone to appear in the final practical training. In addition, if the role of teachers is ignored, the emotional communication between teachers and students will be weakened [8].

4.4 Pay Attention to Later Management and Maintenance Work

After the virtual teaching system is established, on the one hand, it must give full play to its due teaching benefits, on the other hand, it cannot be "just used and ignored." Some units pay little attention to the management and maintenance of the virtual reality teaching system, and fail to formulate strict management and maintenance standards, which have little effect on improving the quality of vocational education training and teaching. The virtual reality system is usually composed of various high-precision instruments [9]. The equipment design is complicated and the use requirements are high. Only by strengthening its management and maintenance in the teaching and training process can the virtual reality teaching system be effectively

operated and rationally used, and can it be fully utilized. Give full play to its teaching effectiveness.

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